

REMARKS

All pending claims have been rejected pursuant to 35 USC § 103(a) as being unpatentable over Farkas et al. (U.S. Pat. No. 5,773,364) in light of one of Bayer et al. (U.S. Pat. No. 4,944,836), Grumbine et al. (U.S. Pat. No. 6,083,419), Skrovan et al. (U.S. Pat. No. 5,916,819), Farkas (*Oxidation and Etching of Tungsten in CMP Slurries*), and Brusie (*Electrochemical Approach to Au and Cu CMP Process Development*). Claims 6, 10, and 11 have been canceled. Additionally, independent claims 1 and 26 have been amended to overcome all rejections as described below.

Claim 1 has been amended to include reference to "glycine" as affecting pH value and to include reference to "an anti-oxidizing BTA agent". Claim 26 has been amended to include reference to "a glycine complexing agent". Additionally, both claims have been amended to include reference to a chemical-mechanical polishing slurry which is "for a copper based metal".

As previously argued, there appears to be little motivation for the combination of the above references with one another or as applied to the present application. For example, the main reference of Farkas (the patent) is focused on a slurry which "does not contain metallic species" or "mobile ions", whereas the present application is directed toward a "Ceric-Ion Slurry" (see both independent claims noted above and the Title of the present application). While there appears to be very little to suggest application of the noted references to the present application (as noted above), there is even less motivation for combining the individual references with one another. For example, the Brusie reference, relied upon for teaching the use of glycine, actually only references glycine in a manner suggesting that glycine should NOT be used due to "uncontrollable removal rates" (emphasis added, see p. 181, lines 16-19). Considered separately, the Examiner has failed to deem these arguments sufficient. However, the claims have been amended as indicated above in a manner that requires consideration of such arguments in light of one another. That is, the remaining independent claims have been further

amended in a manner that would require even further combination of such suspect references.

In addition to the above-argued amendments, the independent claims have been amended to point out that the slurry described is for application to "a copper based metal". This reference has been added pursuant to the Examiner's comments at the last paragraph of page 5 of the Action and further distinguishes the claimed invention from the cited references. In light of these arguments, applicants respectfully request removal of rejections pursuant to 35 USC § 103.

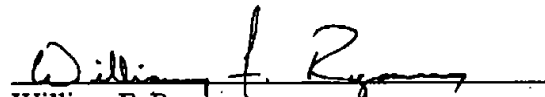
CONCLUSION

Applicants respectfully submit the present application is in condition for allowance. Furthermore, applicants respectfully request removal of the present application from Final status as the indicated amendments do not present new matter or require addition search or substantial addition consideration. Authorization is hereby granted to credit any overpayment or to charge any fees or fee deficiencies in connection with this communication to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP

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William F. Ryan
Reg. No. 44,313

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, California 90025-1030
Telephone (512) 330-0844
Facsimile (512) 330-0476

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. **(Twice Amended)** A chemical-mechanical polishing slurry for a copper based metal layer on a semiconductor substrate, the chemical-mechanical polishing slurry comprising:
- a liquid;
 - cerium ions as an oxidizer in the liquid, the cerium ions being in a quantity equal to the inclusion of at least 0.02 molar ammonium cerium nitrate in the liquid;
 - an abrasive in the liquid, the liquid, the cerium ions and the abrasive together having a first pH value; [and]
 - a pH increasing glycine substance in the liquid that increases the first pH value to a second pH value above 1.5 and below 3.0; and
 - an anti-oxidizing BTA agent.
6. **(Canceled)**
10. **(Canceled)**
11. **(Canceled)**
26. **(Once Amended)** A chemical-mechanical polishing slurry for polishing a copper based metal, the chemical-mechanical polishing slurry comprising:
- a liquid;
 - an oxidizer comprising cerium ions in a quantity equal to the inclusion of at least 0.02 molar ammonium cerium nitrate in the liquid;
 - an abrasive in the liquid;
 - benzotriazole (BTA) in the liquid to inhibit corrosion; and

a glycine complexing agent in the liquid and to increase a pH value of the slurry to above 1.5 and below 3.0.